Water Quality

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Objectives:

- **To issue advisories to Environmental Authorities/Pollution Control Board on coastal water pollution**

- **To provide additional informations on dissolved oxygen content for potential fishing zone advisories**

Biogeochemical Forecasting System – An example

bathing water
recreational water

DHI WATER & ENVIRONMENT

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Good water quality, clean beaches, health safety and economic benefits are the results of intelligent management of bathing waters. Proper management ensures attractive recreational areas for both residents and tourists. With relevant information, the closing of beaches can be reduced. Less sickness means less expenses for medical care, lost working days or lost holidays. DHI tools and services assist in improving bathing water management.

Water Quality Forecasting

DHI's Bathing Water Forecasting System predicts the bathing water quality up to 4 days ahead; just like the weather forecast. This kind of information system has proved to be very reliable and highly appreciated by the public. »»

Pollution Assessment and Remediation

Sources of pollution are ample and it is important to track and identify these sources to control them. DHI modelling is one efficient approach to assess the problems. Microbiological testing is another useful way to track sources of pollution. »»

Health Risks and Safety Planning

Blooms of toxic cyanobacteria pose a threat to human health. Swallowing infected water may cause bleary eyes, fever and diarrhoea. DHI assists in measuring algae and toxins, assessing risk and planning warning and measure programs. »»

DHI Tools for Managers and the Public

DHI establishes bathing water profiles describing environmental conditions, potential sources of contamination and their impacts, as well as health risks and the efficiency of the monitoring network. GIS is an important tool in this work. »»

The EU Directive

The new EU Bathing Water Directive provides for the improvement of health, safety and water quality management. It calls for the authorities to be pro-active and offer quick and adequate notification to the public. »»

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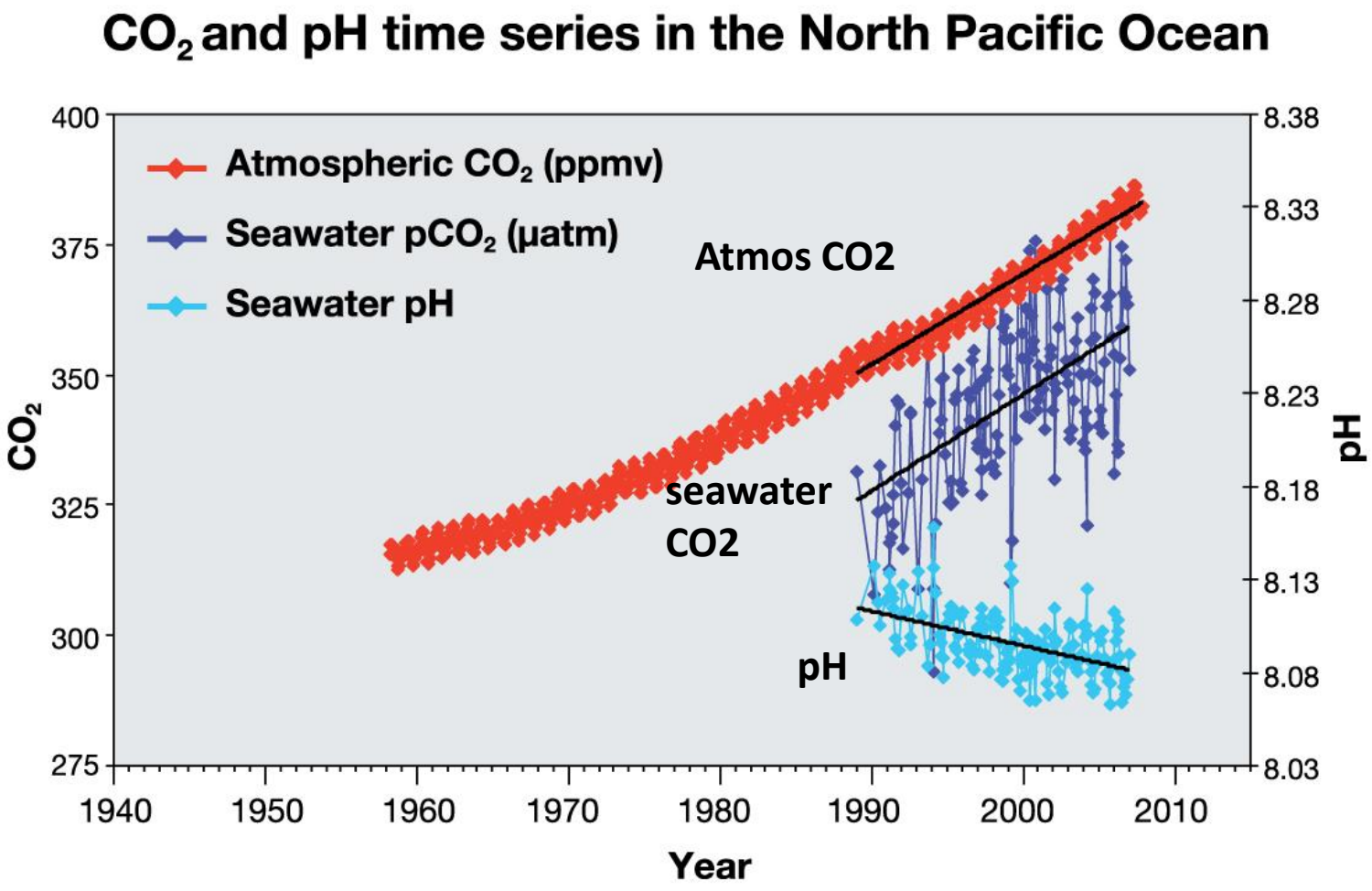
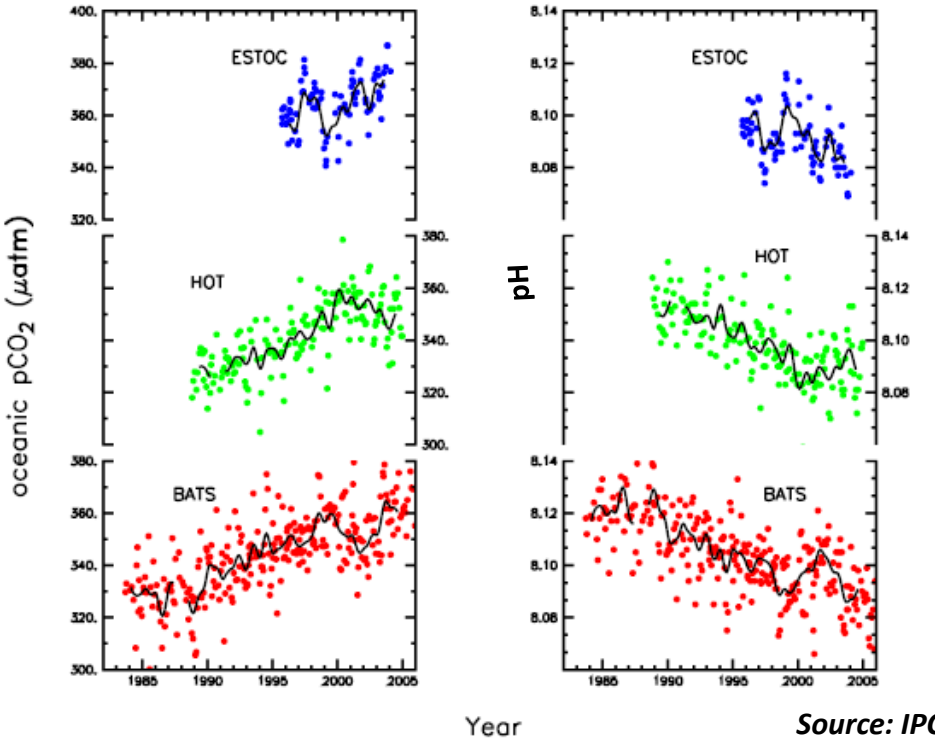
Basic Water Quality Parameters

- Salinity
- Temperature
- Dissolved oxygen (DO)
- pH
- Total dissolved solids (TDS)/Ammonium/Nitrate etc
- Turbidity

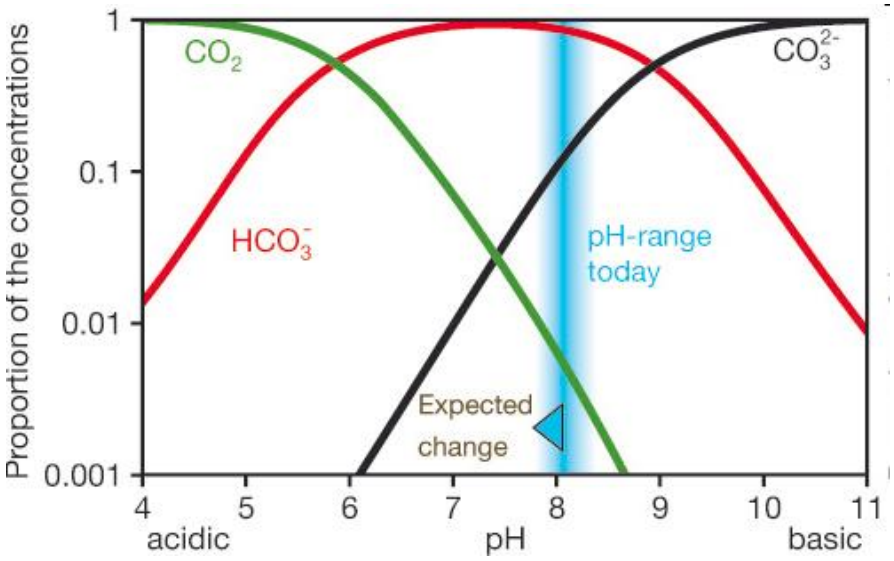
Ocean acidification



Ocean Acidification



Source: IPCC 2007



Carbonate Buffer

pCO_2 is increasing in oceanic water causing ocean acidification, a cause of concern

No systematic measurement of pCO_2 in the Indian Ocean after JGOFS

Fate of anthropogenic CO_2 emissions

(2000-2008)

+

45%

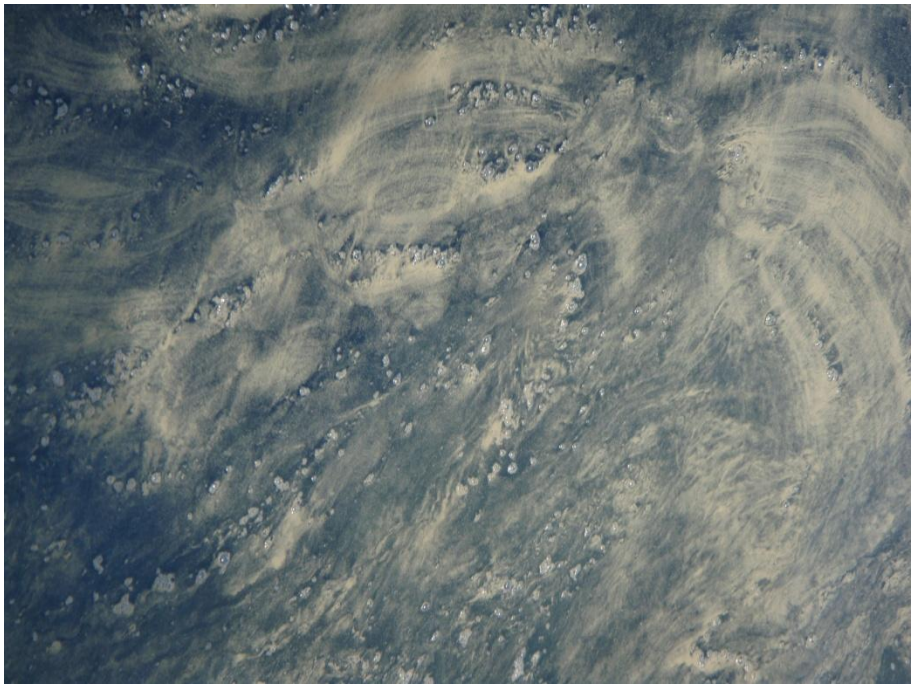
29%

26%

Le Quéré et al. 2009, Nature geoscience; Canadell et al. 2007, PNAS, updated

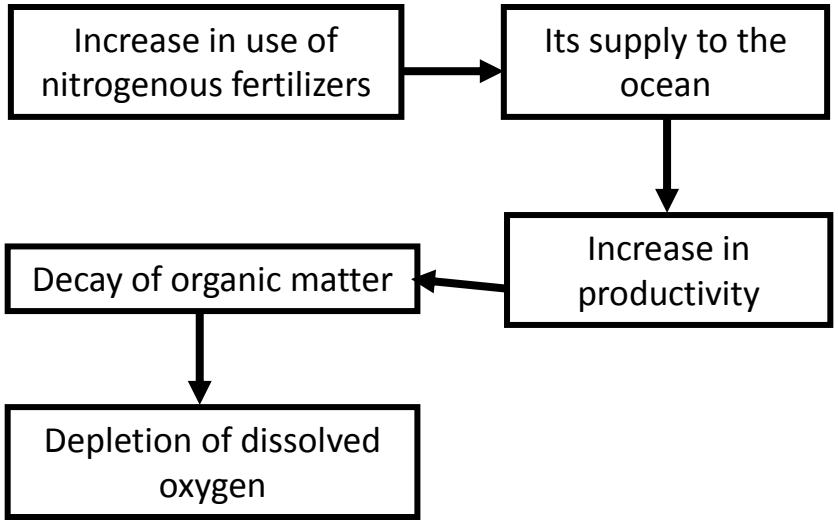
Blooms associated water quality problems

Food Poisoning???

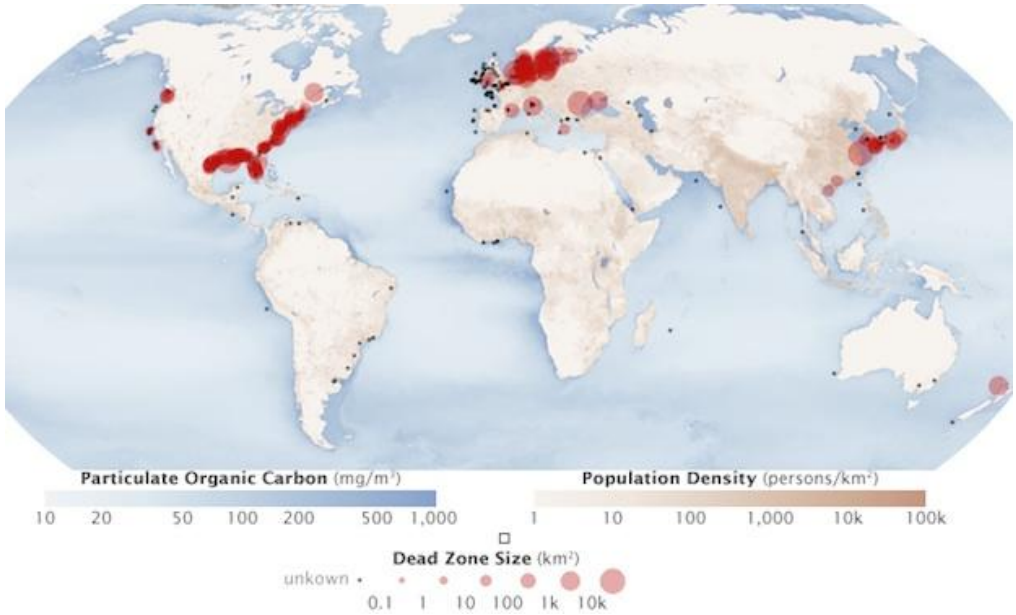


Dead Zones

Dead zones in the ocean are defined as zones where marine life can not be supported due to depleted oxygen levels



Distribution of dead zones in the world

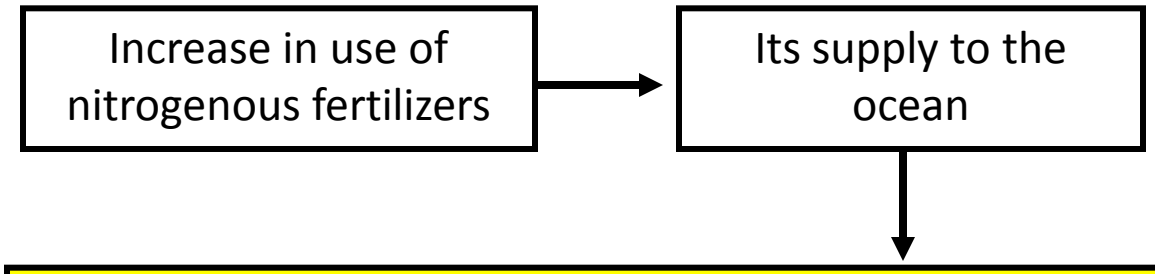


Year	No. of Dead Zones
2004	146
2008	405

Total area affected: 245,000 sq Km

Diaz and Rosenberg, Science, 2008

Dead Zones: Some Facts



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We need to monitor our coastal waters

Diaz and Rosenberg, Science, 2008

A huge amount of Nitrogen based fertilizer are also used in Indian Subcontinent. This nitrogen is getting transported to the ocean via rivers and are capable of causing “Dead Zones” along the Indian Coast. Therefore, we need to monitor our coastal regions to start mitigation well in advance.

Water Quality Now-casting System

- An example from Columbia River Estuary

Station: *SATURN04*

Image archive | Network status | More stations

Latest observations

	Variable	Value	Unit
●	Salinity	0.14	psu
●	Temperature	8.61	C
●	CDOM	16.24	QSDE
●	Nitrate	-	uM
●	Oxygen	8.5	mg/L
●	Oxygen saturation	8.15	mg/L
●	Pressure	0.29	db
●	Scattering coefficient	0.02	1/m x sr
●	Fluorescence	8.13	ug/l
●	Turbidity	6.56	NTU

Hover mouse over colored dots (above) to see time stamp.

● < 1 day
● 1 day < t < 2 days
● > 2 days

Data Disclaimer: Raw data, not subject to quality control. Tide information is from Astoria.

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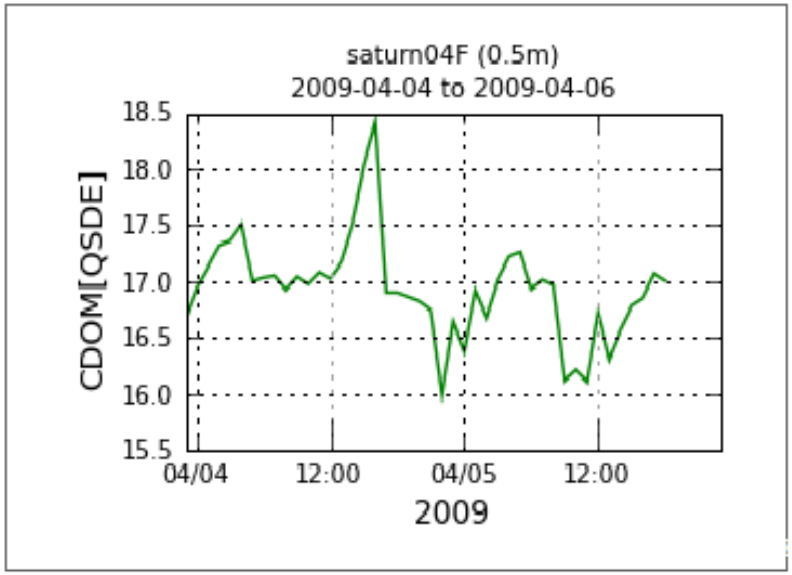
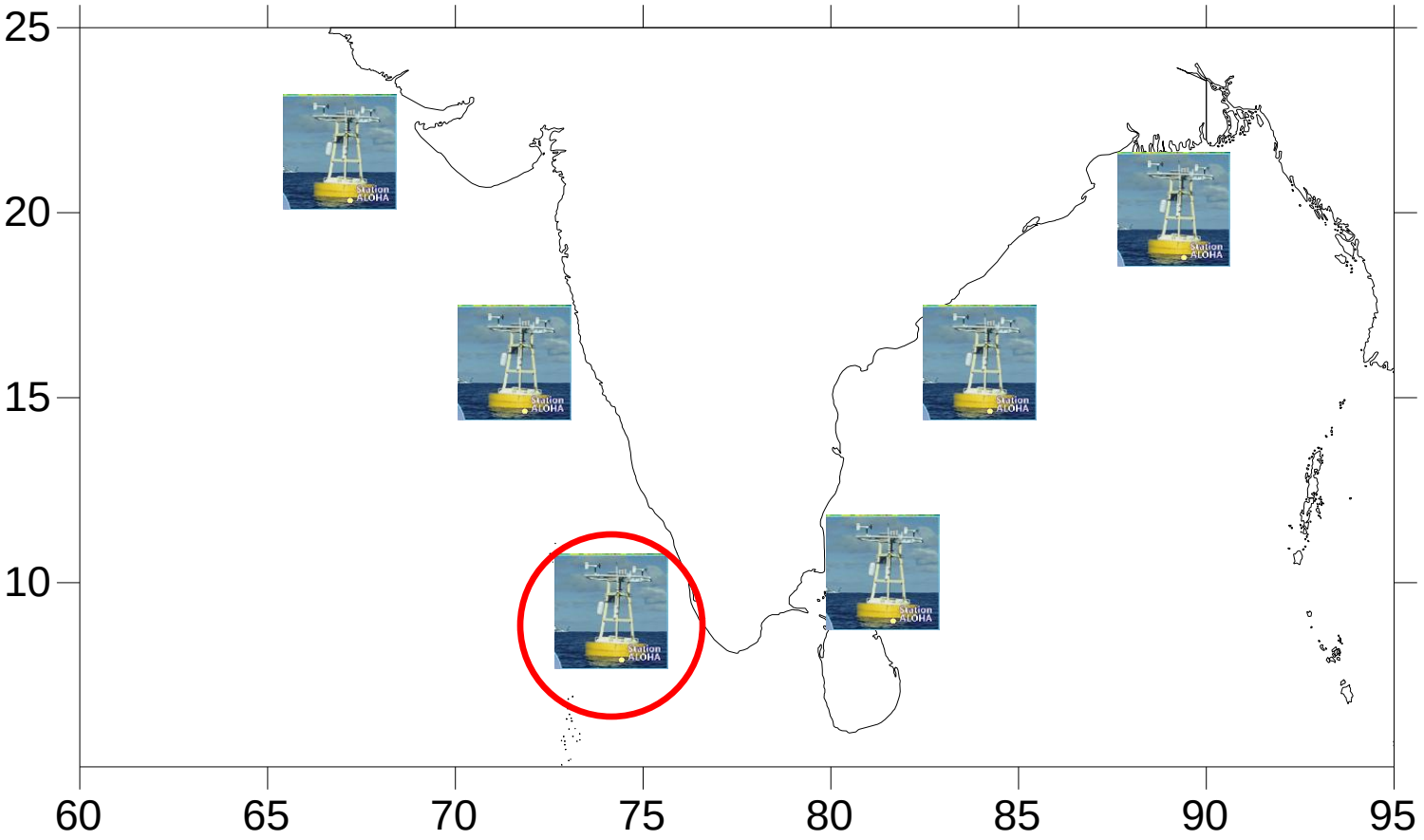


Variable: cdom

2 Days | 7 Days | 15 Days

About this station	
Location:	46.19°N,123.75°W
First deployment:	2008-09-29
Observation network:	SATURN
Data provider:	CMOP

Probable mooring locations along the Indian coast



During the 1st phase one moorings will be put, with different biogeochemical sensors, near Kochi in the Arabian Sea

Water Quality: we need to achieve this!!

THANK YOU